National Institute of Environmental Health Sciences

# Food-borne diseases - The challenges of 20 years ago still persist while new ones continue to emerge

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**Abstract:**

The burden of diseases caused by food-borne pathogens remains largely unknown. Importantly data indicating trends in food-borne infectious intestinal disease is limited to a few industrialised countries, and even fewer pathogens. It has been predicted that the importance of diarrhoeal disease, mainly due to contaminated food and water, as a cause of death will decline worldwide. Evidence for such a downward trend is limited. This prediction presumes that improvements in the production and retail of microbiologically safe food will be sustained in the developed world and, moreover, will be rolled out to those countries of the developing world increasingly producing food for a global market. In this review evidence is presented to indicate that the microbiological safety of food remains a dynamic situation heavily influenced by multiple factors along the food chain from farm to fork. Sustaining food safety standards will depend on constant vigilance maintained by monitoring and surveillance but, with the rising importance of other food-related issues, such as food security, obesity and climate change, competition for resources in the future to enable this may be fierce. In addition the pathogen populations relevant to food safety are not static. Food is an excellent vehicle by which many pathogens (bacteria, viruses/prions and parasites) can reach an appropriate colonisation site in a new host. Although food production practices change, the well-recognised food-borne pathogens, such as Salmonella spp. and Escherichia coli, seem able to evolve to exploit novel opportunities, for example fresh produce, and even generate new public health challenges, for example antimicrobial resistance. In addition, previously unknown food-borne pathogens, many of which are zoonotic, are constantly emerging. Current understanding of the trends in food-borne diseases for bacterial, viral and parasitic pathogens has been reviewed. The bacterial pathogens are exemplified by those well-recognized by policy makers; i.e. Salmonella, Campylobacter, E. coli and Listeria monocytogenes. Antimicrobial resistance in several bacterial food-borne pathogens (Salmonella, Campylobacter, Shigella and Vibrio spp., methicillin resistant Staphylcoccus aureas, E. coli and Enterococci) has been discussed as a separate topic because of its relative importance to policy issues. Awareness and surveillance of viral food-borne pathogens is generally poor but emphasis is placed on Norovirus, Hepatitis A, rotaviruses and newly emerging viruses such as SARS. Many food-borne parasitic pathogens are known (for example Ascaris, Cryptosporidia and Trichinella) but few of these are effectively monitored in foods, livestock and wildlife and their epidemiology through the food-chain is poorly understood. The lessons learned and future challenges in each topic are debated. It is clear that one overall challenge is the generation and maintenance of constructive dialogue and collaboration between public health, veterinary and food safety experts, bringing together multidisciplinary skills and multi-pathogen expertise. Such collaboration is essential to monitor changing trends in the well-recognised diseases and detect emerging pathogens. It will also be necessary understand the multiple interactions these pathogens have with their environments during

transmission along the food chain in order to develop effective prevention and control strategies.

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## Resource Description

**Communication:**

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

**Communication Audience:**

audience to whom the resource is directed

Policymaker

**Exposure :**

weather or climate related pathway by which climate change affects health

Food/Water Quality, Food/Water Quality

**Food/Water Quality:** Biotoxin/Algal Bloom, Pathogen, Pathogen

**Geographic Feature:**

resource focuses on specific type of geography

None or Unspecified

**Geographic Location:**

resource focuses on specific location

Global or Unspecified

**Health Impact:**

specification of health effect or disease related to climate change exposure

Diabetes/Obesity, Infectious Disease

**Infectious Disease:** Foodborne/Waterborne Disease, Zoonotic Disease

**Foodborne/Waterborne Disease:** Other Diarrheal Disease

**Intervention:**

strategy to prepare for or reduce the impact of climate change on health

A focus of content

**Mitigation/Adaptation:**

mitigation or adaptation strategy is a focus of resource

Adaptation

**Population of Concern:** A focus of content

**Population of Concern:** ☑

populations at particular risk or vulnerability to climate change impacts

Children, Elderly, Low Socioeconomic Status, Pregnant Women

**Resource Type:** ☑

format or standard characteristic of resource

Review

**Timescale:** ☑

time period studied

Time Scale Unspecified